

### **REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 20, 23, 24 and 26-28 are pending in the application.

Claim 23 has been amended to delete ricinoleic acid which renders the definition of the group of unsaturated aliphatic monocarboxylic acids in claim 23 consistent with that listed in claim 26.

The sole issue raised in the outstanding Official Action is the patentability of all of the pending claims over a combination of four distinct pieces of prior art.

All the pending claims stand rejected over Hagio et al. (USP 4,524,104) in view of Laas et al. (USP 5,847,044) and Nakamura et al. (USP 5,317,034) and Hannah et al. (USP 4,952,659).

The Examiner takes the position that it would have been obvious to utilize salts derived from unsaturated acids and cyclic amidines, such as DBU, DBN, and DBD, in their art recognized as catalysts for polyurethane and isocyanate based polymeric systems, and that it further would have been obvious to utilize the salts in virtually any type of polyurethane yielding system, including two-component systems, and that the use of virtually any unsaturated acid to block the catalyst would have been obvious in view of the teachings of the cited references (*see* item 5 of the Action).

The Examiner also alleges that "one would reasonably expect from the teachings of the primary and secondary references and the general state of the art that the disclosed catalysts would catalyze the reaction of virtually any polyisocyanate-polyol reactant mixture" *see* page 4, lines 2-6 of the Action.

The Examiner's positions seem to be based on an assumption that any of the catalysts known for polyurethane equally catalyze any polyurethane-forming reactions in the same manner but fails to recognize the differences between the present invention and the cited references.

For detailed analysis of the cited references, please see the Amendment and response of May 12, 2005.

The adhesive composition of Hagio et al. is different from the two component polyurethane sealant of the present invention not only in the reactants involved in the urethane-forming reaction, but also the catalyst and the intended use. Firstly, the adhesive composition of Hagio et al. utilizes the urethane-forming reaction between (A) an acrylic copolymer having

NCO-reactive groups and (B) a blocked polyisocyanate, whereas the sealant of the present invention utilizes the urethane-forming reaction between a specific polyol and an unblocked isocyanate. Thus, they are different in both reactants. The Examiner alleges that blocked or not, it is not seen that such an exclusion would serve to overcome the prior art.

Secondly, although Hagio et al. discloses the use of (C) a cycloamidine (such as DBU, DBN and DBD) or acid addition salt thereof as a catalyst, Hagio et al. does not disclose salts of a cycloamidine with any of the acids recited in the claims of the present application. In addition, the adhesive composition of Hagio et al. and the sealant of the present invention are used differently, i.e., are cured at different temperatures.

A person skilled in the art given the cited references would not have arrived at the sealant of the present invention if he started from the teaching of Hagio et al., because he would have to go through so many changes (in both reactants, catalyst and curing temperature) which drastically affect the nature of the urethane-forming reaction, and none of the cited references suggest making all these changes. Therefore, Hagio et al. is inappropriate as a primary reference.

Even if he were motivated to use an unblocked isocyanate and the specific polyol because he was originally trying to devise a two component sealant using a polyol-isocyanate reaction which cures at ambient temperature, he would definitely not have started from the teaching of Hagio et al. because in that case, Hagio et al. which relates to a quite different polyurethane-forming reaction is no longer the closest prior art. Even if he started from the teaching of Hagio et al. in that case, he would never have arrived at the sealant composition of the present invention because none of the cited references suggest which catalysts can satisfy the requirements peculiar to sealants to be cured at ambient temperature (a long pot life and rapid viscosity increase) while compensating the use of an unblocked isocyanate instead of a blocked isocyanate as in Hagio et al. Besides, the claimed combination of a bicyclic tertiary amine and an unsaturated acid is not disclosed by any of the cited references, in the first place.

Therefore, the present invention would never have been obvious from the cited references.

The Examiner alleges that "one would reasonably expect from the teachings of the primary and secondary references and the general state of the art that the disclosed catalysts would catalyze the reaction of virtually any polyisocyanate-polyol reactant mixture" *see page 4,*

lines 2-5 of the Action. However, one would not expect that the catalysts disclosed in Hagio et al. would catalyze the virtually any polyurethane-forming reaction in a desired manner (i.e., to satisfy a long pot life and rapid viscosity increase) . In fact, some of the catalysts disclosed in Hagio et al. are unsuitable for the urethane-forming reaction used in the present invention.

Hagio et al. discloses that "Acid addition salts of the cycloamidines are also useful" in column 2, lines 59-60 and as the acid, mentions that "Among these, preferred are phenols (particularly phenol) and carboxylic acids (particularly formic acid and 2-ethyl hexanoic acid)" (column 3, lines 28-30). Actually, cycloamidine salts with phenol and 2-ethylhexanoic acid were also used in Examples 3 and 4.

However, in Comparative Examples 2, 3 and 6 in the present application, the use of cycloamidine salts with phenol, formic acid and 2-ethylhexanoic acid in the urethane-forming reaction between the claimed polyol and the claimed organic polyisocyanate and/or isocyanate prepolymer gave undesirable results (*see* page 26, lines 6-17 of the specification).

The results presented in the original specification accompanied by the executed declaration signed by the inventors have significant evidentiary weight, comparable to the weight given to an executed declaration. It is well established by the Federal Circuit that "the examiner must consider comparative data presented in the specification which is intended to illustrate the claimed invention in reaching a conclusion in regard to the obviousness of claims." *In re Margolis*, 785 F.2d 1029, 228 U.S.P.Q. 1123, 1129 (Fed. Cir. 1993).

In this respect, on page 5, lines 6-8 of the Action, the Examiner alleges that with respect to the examples pertaining to the use of formic acid and ethylhexanoic acid, it is unclear that these results when compared to the results of the instant invention clearly indicate that the results of the examples of the invention are unexpected.

For a urethane sealing material to be cured at ambient temperature like the sealant of the present invention, from the viewpoint of operation efficiency, it has been desired to prolong the pot life as long as possible and to obtain a rapid viscosity increase (page 3, lines 2-5 of the specification). In Examples 7-12, a rapid viscosity increase was observed (Figs. 1-6) after such a long pot life as from 760 to 847 sec (page 23). In contrast, in Comparative Example 2 (formic acid), the pot life (672 sec) was shorter by over 1 minute than in the Examples, and in Comparative Example 3 (2-ethylhexanoic acid), the pot life (312 sec) was even shorter and

decreased by more than 5 minutes as compared with the Examples (page 25). Further, in Comparative Example 3, the viscosity increase was slow, too (Fig. 9).

Although the Examiner alleges that "It appears that each of these argued examples, both those of the invention and not, display to differing degrees a latent catalytic effect that would be expected of these catalytic systems" on page 5, lines 8-10 of the Action, applicant points out that in Comparative Example 3, despite the short pot life, the viscosity increase was slow.

Thus, the results in Examples 2 and 3 pertaining to the use of formic acid and ethylhexanoic acid clearly indicate that the results of the examples of the invention are unexpected.

The Examiner also alleges that "it is unclear that comparative examples based upon the use of p-toluenesulfonic acid are particularly relevant" (see sentence bridging pages 4-5 of the Action. They are relevant as explained below.

In this respect, Hannah et al., which relates to a polyurethane sealant composition comprising a polyurethane prepolymer having blocked isocyanate groups and an amine curing agent, discloses the use of 1,8-diazobicyclo(5:4:0)undecene-7 (DBU), derivatives thereof, or 1,5-diazobicyclo(4:3:0)non-5-ene (DBN) or derivative thereof as a catalyst (column 1, lines 15-16-19). As to the catalyst, Hannah et al. mentions that:

The various derivatives or reaction products of the bicyclic amidine which can be utilized in the present invention as a catalyst include the reaction product of DBU or DBN with phenol, as well as with various other acidic compounds, Such as acidic compounds include the various sulfonic acids such as p-toluenesulfonic, sulfimides, sulfamides, phosphonic acids, the various N-sulfonylcarboxamides which have a total of from 2 to about 36 carbon atoms, and the various carboxylic acids which have a total of from 2 to 18 carbon atoms

in column 5, lines 18-27. Thus, Hannah et al. discloses salts of DBU or DBN with phenol and p-toluenesulfonic acid and salts of DBU or DBN with carboxylic acids without discrimination.

If the Examiner's logic that one would reasonably expect from the teachings of the primary and secondary references...that "the disclosed catalysts would catalyze the reaction of virtually any polyisocyanate-polyol reactant mixture", one would necessarily expect that any of the catalysts disclosed by Hannah et al. would catalyze the urethane-forming reaction used in the

present invention. This, in fact, is not the case. When the DBU salt with p-toluenesulfonic acid was used as the catalyst in Comparative Example 4, the viscosity increase hardly takes place and even when a large amount of the catalyst is used, no rapid increase of the viscosity is observed (page 26, lines 18-27 of the specification). Thus, Comparative Example 4 based upon the use of p-toluenesulfonic acid clearly demonstrates that not all the catalysts disclosed by Hannah et al. can be used in the present invention, and that the results of the Examples of the invention are unexpected because none of the cited references suggest which catalyst is suitable for the sealant composition of the present invention.

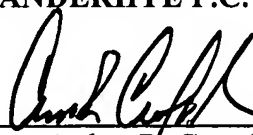
Further, although the Examiner takes the position that the use of virtually any unsaturated acid to block the catalyst would have been obvious in view of the teachings of the references, the Examiner's position is based on hindsight because none of the cited references suggest the concept of blocking a catalyst in order to satisfy the requirements of a long pot life and rapid viscosity increase. Because none of the cited references relate to urethane-forming systems using an unblocked isocyanate which require a long pot life and rapid viscosity increase, one skilled in this art seeking a polyurethane sealant composition having a long pot life and rapid viscosity increase would never have conceived the concept of blocking a catalyst. Even though the polyurethane sealant composition of Hannah et al. requires a long pot life and rapid viscosity increase, one would not have conceived the concept of blocking the catalyst because it uses a blocked isocyanate to attain a long pot life.

Therefore, the rejection over Hagio et al. in view of Laas et al., Nakamura et al. and Hannah et al. is groundless and should be withdrawn.

Respectfully submitted,

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